

AMENDMENT(S) TO THE DRAWINGS

Please amend Fig. 1 as indicated in red on the attached annotated marked-up drawing. A replacement sheet presenting replacement figure(s), which incorporate the desired changes is also enclosed.

REMARKS

Claims 38-73 are pending; claims 38-56, 66, 67, 69 and 72 are rejected; and claims 57-65, 68, 70, 71 and 73 are objected to in this application. Claims 38, 42, 49, 57, 66, 68, 70, 71 and 73 are amended; claim 39 is cancelled; Fig. 1 is amended; and the specification is amended hereby.

Responsive to the rejection of claim 49 under 35 U.S.C. § 112, second paragraph, Applicants have amended claim 49 to reflect a dependence upon claim 46 rather than claim 45. For the foregoing reason, Applicants submit that claim 49 is now in condition for allowance, which is hereby respectfully requested.

Responsive to the drawing objection, wherein it is indicated that the magnetic field device feature has not been shown in the drawings, Applicants have amended Fig. 1 to portray magnetic field device 60. Further, Applicants have amended the specification to properly refer to magnetic field device 60. For the foregoing reasons, Applicants submit that the drawings are now in allowable form and respectfully request the withdrawal of the objection to the drawings.

Responsive to the rejection of claim 38 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,513,683 (Kisler et al. '683), Applicants have amended claim 38 and submit that claim 38 is now in condition for allowance.

Kisler et al. '683 disclose a coating uniformity improvement apparatus (Figs. 1-4) including a backing roller 12 that is cylindrically shaped and electrically conductive. Backing roller 12 is mounted for rotation about backing roller axis 14. A high voltage power supply 20, having a DC voltage across its output terminals, is connected between backing roller 12 and applicator 16 through paths 22 and 24. When power supply 20 is energized through path 25, electrostatic field 26 is produced in coating gap 18 between high potential backing roller 12 and grounded applicator 16. As a charge-retaining web 28 is moved in direction 30 through gap 18,

web 28 is electrostatically charged by orienting its dipoles with said electrostatic field 26.

Electrostatic charges produced on web 28 by electrostatic field 26 cause fluid 32 flowing from applicator 16 into coating gap 18 to be attracted toward and uniformly deposited on moving web 28 (column 3, lines 14-43).

In contrast claim 38 as amended recites in part:

an electrode arrangement altering an electrical potential of said application medium curtain as it moves to the substrate.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Kisler et al. '683 or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Kisler et al. '683 disclose a coating uniformity improvement apparatus that alters the electrostatic charges produced on a web, which cause the fluid flowing from the applicator into the coating gap to be attracted toward and uniformly deposited on the moving web. In contrast, Applicants' invention alters the electrical potential of the application medium after it leaves the applicator and as it moves to the substrate under the force of gravity. Kisler et al. '683 does not teach the altering of the electrical potential of an application medium curtain as it travels from an applicator to a substrate. Therefore Kisler et al. '683 fails to disclose, teach or suggest an electrode arrangement altering an electrical potential of the application medium curtain as it moves to the substrate, as recited in claim 38.

An advantage of Applicants' invention is that it improves the adhesion of the application medium to the web and particularly provides for improved adhesion at the edge of the web. For the foregoing reasons, Applicants submit that claim 38 is now in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claim 42 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,470,274 (Sandiford et al.), Applicants have amended claim 42 and submit that claim 42 is now in condition for allowance.

Sandiford et al. disclose a thermal plastic film production method and apparatus (Fig. 1) in which a polypropylene film 1 is extruded from die 2. Polypropylene film 1 is chilled on quenching drum 3. Quenching drum 3 is connected to earth as shown at 4. Wire 5, which is connected to a source of high potential, forms an electrode 5. Hot air blower 6, which is made up of a centrifugal fan and an electrical heating element directs a stream of air at an elevated temperature of from 200 to 250°C between the electrode and the quenching film (column 3, lines 23-32).

In contrast claim 42, as amended, recites in part:

a floating potential electrode upstream from the device, said floating potential electrode receiving an electric field from said electrode arrangement and imparting an electric field to the moving substrate.

(Emphasis added). Applicants submit that such an invention is neither, disclosed nor suggested by Sandiford et al. or any of the other cited references, alone or in combination, it has distinct advantages thereover.

Sandiford et al. disclose a thermal plastic film production method and apparatus having a hot air blower with a centrifugal fan and an electrical heating element that directs a stream of air at an elevated temperature between an electrode and the quenching film. In Applicants' invention a floating potential electrode receives an electric field and imparts the electrical field to a moving substrate. Sandiford et al. does not disclose an electrode that receives an electric field and imparts an electric field to a moving substrate. Therefore, Sandiford et al. fails to disclose, teach or suggest a floating potential electrode upstream from the device, the floating potential electrode

receiving an electrical field from the electrode arrangement and imparting an electric field to the moving substrate, as recited in claim 42.

An advantage of Applicants' invention is that the floating potential electrode passively receives and imparts an electric field to a moving substrate, which may be a fiber web. For the foregoing reasons, Applicants submit that claim 42 is now in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claims 38, 41-43, 50 and 53 under 45 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,489,672 (Kisler et al. '672), Applicants have amended claims 38 and 42 and submit that claims 38, 41-43, 50 and 53 are now in condition for allowance.

Kisler et al. '672 disclose a coating uniformity improvement apparatus (Figs. 1-4) including a backing roller 12 that is cylindrically shaped and electrically conductive. Backing roller 12 is mounted for rotation about backing roller axis 14. A high voltage power supply 20, having a DC voltage across its output terminals, is connected between backing roller 12 and applicator 16 through paths 22 and 24. When power supply 20 is energized through path 25, an electrostatic field 26 is produced in coating gap 18 between high potential backing roller 12 and grounded applicator 16. As a charge-retaining web 28 is moved in direction 30 through gap 18, web 28 is electrostatically charged by orienting its dipoles with said electrostatic field 26. Electrostatic charges produced on web 28 by electrostatic field 26 cause fluid 32, flowing from applicator 16 into coating gap 18, to be attracted toward and uniformly deposited on moving web 28 (column 2, line 52 through column 3, line 12).

In contrast claim 38 as amended recites in part:

an electrode arrangement altering an electrical potential of said application medium curtain as it moves to the substrate.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Kisler et al. '672 or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Kisler et al. '672 disclose a coating uniformity improvement apparatus that provides for electrostatic charges produced on web 28 by an electrostatic field to cause the fluid flowing from the applicator into a coating gap to be attracted toward and uniformly deposited on a moving web. In contrast, Applicants' invention alters the electrical potential of the application medium after it leaves the applicator and as it moves to the substrate under the force of gravity. Kisler et al. '672 does not teach the altering of the electrical potential of an application medium curtain as it travels from an applicator to a substrate. Therefore Kisler et al. '672 fails to disclose, teach or suggest an electrode arrangement altering an electrical potential of the application medium curtain as it moves to the substrate, as recited in claim 38.

An advantage of Applicants' invention is that it improves the adhesion of the application medium to the web and particularly provides for improved adhesion at the edge of the web. For the foregoing reasons, Applicants submit that claim 38 and claim 41 depending therefrom are now in condition for allowance, which is hereby respectfully requested.

In further contrast claim 42, as amended, recites in part:

a floating potential electrode upstream from the device, said floating potential electrode receiving an electric field from said electrode arrangement and imparting an electric field to the moving substrate.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Kisler et al. '672 or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Kisler et al. '672 disclose a coating uniformity improvement apparatus that provides for electrostatic charges produced on a web by an electrostatic field to cause the fluid flowing from the applicator into a coating gap to be attracted toward and uniformly deposited on a moving web. In Applicants' invention a floating potential electrode receives an electric field and imparts the electrical field to a moving substrate. Kisler et al. '672 does not disclose an electrode that receives an electric field and imparts an electric field to a moving substrate. Therefore Kisler et al. '672 fails to disclose, teach or suggest a floating potential electrode upstream from the device, the floating potential electrode receiving an electrical field from the electrode arrangement and imparting an electric field to the moving substrate, as recited in claim 42.

An advantage of Applicants' invention is that the floating potential electrode passively receives and imparts an electric field to a moving substrate, which may be a fiber web. For the foregoing reasons, Applicants submit that claim 42, and claims 43, 50 and 53 depending therefrom, are now in condition for allowance, which is hereby respectfully requested.

Claims 50 and 51 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kisler et al. '672 in view of German Patent DE 197 33 333. However, claims 50 and 51 depend from claim 42, which is in condition for allowance for the reasons given above. Accordingly, Applicants submit that claims 50 and 51 are in condition for allowance, which is hereby respectfully requested.

Claims 55 and 56 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kisler et al. '672 in view of U.S. Patent No. 3,206,323 (Miller). However, claims 55 and 56 depend from claim 42, which is in condition for allowance for the reasons given above. Accordingly, Applicants submit that claims 55 and 56 are in condition for allowance, which is hereby respectfully requested.

Claim 54 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kisler et al. '672 in view of U.S. Patent No. 3,681,138 (Ankendrand et al.). However, claim 54 depends from claim 42, which is in condition for allowance for the reasons given above. Accordingly, Applicants submit that claim 54 is in condition for allowance, which is hereby respectfully requested.

Claims 44 and 52 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kisler et al. '672 in view of U.S. Patent No. 4,402,035 (Kisler '035). However, claims 44 and 52 depend from claim 42, which is in condition for allowance for the reasons given above. Accordingly, Applicants submit that claims 44 and 52 are in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claims 38 and 40 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,332,154 (Maier et al.), Applicants have amended claim 38 and submit that claim 38 and claim 40 depending therefrom are now in condition for allowance.

Maier et al. disclose a shoot-up electrostatic nozzle and method (Fig. 1) including a spray nozzle 11. Spray nozzle 11 includes a fluid delivery system 78, a nozzle body 10, a high voltage power supply 68 and flow paths 30. Target 84 is electrically biased with respect to nozzle 11. Nozzle body 10 is made of electrically insulative material, such as plastic. Spray nozzle 11 is mounted with emitting end 44 directed upwardly relative to bottom 40. Fluid delivery system 78 maintains flowable material 82 in spray nozzle 11 at a selected pressure. The pressure of fluid delivery system 78 is never sufficient to force the fluid to spray out of emitting end 44, but only to flow into interior chamber 42 and to fill the same and to flow to emitting end 44 where it is electrostatically emitted as flow paths 30 (column 4, line 43 through column 5, line 14).

In contrast claim 38 as amended recites in part:

an electrode arrangement altering an electrical potential of said application medium curtain as it moves to the substrate.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Maier et al. or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Maier et al. disclose a shoot-up electrostatic nozzle and method including a spray nozzle 11 having a high voltage power supply and a target that is electrically biased with respect to the nozzle. In contrast, Applicants' invention alters the electrical potential of the application medium after it leaves the applicator and as it moves to the substrate under the force of gravity. Maier et al. does not teach the altering of the electrical potential of an application medium curtain as it travels from an applicator to a substrate. Therefore Maier et al. fails to disclose, teach or suggest an electrode arrangement altering an electrical potential of the application medium curtain as it moves to the substrate, as recited in claim 38.

An advantage of Applicants' invention is that it improves the adhesion of the application medium to the web and particularly provides for improved adhesion at the edge of the web. For the foregoing reasons, Applicants submit that claim 38 and claim 40 depending therefrom are now in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claims 38-42, 45-47, 49 and 54 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,290,600 (Ord et al.), Applicants have amended claims 38 and 42, and submit that claims 38-42, 45-47, 49 and 54 are now in condition for allowance.

Ord et al. disclose an apparatus and process for producing sheets of material (Figs. 1-5) in which a liquid is supplied to passage 14 and passes through distribution gallery 12 to slot 10. In slot 10 the liquid is contacted by a conducting or semi-conducting surface 16, which is connected to the output of a high voltage generator. Surface 16 is connected to the negative terminal of the

high voltage generator, the other terminal being connected to earth. Positive ions are conducted away from the liquid by surface 16 leaving a negative charge on the liquid. An intense electrical field is formed at edge 24 when this is covered with liquid (column 4, lines 38-55). Edge 24 terminates in a large radius of curvature at opposite ends. This is to prevent corona discharge, which may be produced by high electrical stress, which would result from the edge terminating in sharp corners (column 6, lines 6-10).

In contrast claim 38 as amended recites in part:

an electrode arrangement altering an electrical potential of said application medium curtain as it moves to the substrate.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Ord et al. or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Ord et al. disclose an apparatus and process for producing sheets of material. A liquid is contacted by a conducting or semi-conducting surface, which is connected to the output of a high voltage generator. Applicants' invention changes the electrical potential of a falling application medium curtain as it is falling to a substrate. Ord et al. discloses the charging of a liquid that is in electrical contact with the high voltage generator. In contrast, Applicants' invention alters the electrical potential of the application medium after it leaves the applicator and as it moves to the substrate under the force of gravity. Ord et al. does not teach the altering of the electrical potential of an application medium curtain as it travels from an applicator to a substrate. Therefore Ord et al. fails to disclose, teach or suggest an electrode arrangement altering an electrical potential of the application medium curtain as it moves to the substrate, as recited in claim 38.

An advantage of Applicants' invention is that it improves the adhesion of the application medium to the web and particularly provides for improved adhesion at the edge of the web. For the foregoing reasons, Applicants submit that claim 38 and claims 39-41 depending therefrom are now in condition for allowance, which is hereby respectfully requested.

In further contrast claim 42, as amended, recites in part:

a floating potential electrode upstream from the device, said floating potential electrode receiving an electric field from said electrode arrangement and imparting an electric field to the moving substrate.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Ord et al. or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Ord et al. disclose an apparatus and process for producing sheets of material. A liquid is contacted by a conducting or semi-conducting surface, which is connected to the output of a high voltage generator. A charging of the liquid that is in electrical contact with the high voltage generator takes place. In Applicants' invention a floating potential electrode receives an electric field and imparts the electrical field to a moving substrate. Ord et al. does not disclose an electrode that receives an electric field and imparts an electric field to a moving substrate. Therefore Ord et al. fails to disclose, teach or suggest a floating potential electrode upstream from the device, the floating potential electrode receiving an electrical field from the electrode arrangement and imparting an electric field to the moving substrate, as recited in claim 42.

An advantage of Applicants' invention is that the floating potential electrode passively receives and imparts an electric field to a moving substrate, which may be a fiber web. For the foregoing reasons, Applicants submit that claim 42, and claims 45-47, 49 and 54 depending therefrom, are now in condition for allowance, which is hereby respectfully requested.

Claim 48 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Ord et al. However, claim 48 depends from claim 42, which is in condition for allowance for the reasons given above. Accordingly, Applicants submit that claim 48 is in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claims 66, 67 and 69 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,338,359 (Conroy et al.), Applicants have amended claim 66, and submit that claim 66, 67 and 69 are now in condition for allowance.

Conroy et al. disclose a hopper preparation pan with edge walls (Figs. 3-6) including a coating hopper 10. While in operation coating hopper 10 is translated to a position over coating roller 12 in order to coat support 13 with a falling curtain of coating composition. A boundary air vacuum baffle 15 removes air moving with the web that would otherwise disturb the free-falling curtain (column 3, lines 15-24).

In contrast, claim 66 as amended, recites in part:

an electrode arrangement altering an electrical potential of said curtain as it moves from said curtain applicator unit to the moving substrate.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Conroy et al. or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Conroy et al. discloses a hopper preparation pan with edge walls and a boundary air vacuum baffle that removes air moving with the web that would otherwise disturb the free-falling curtain. Applicants' invention alters the electrical potential of the curtain as it is in route to the moving substrate. In contrast, Conroy et al. removes air moving along the web that would otherwise disturb the free-falling curtain. Therefore, Conroy et al. fails to disclose, teach or

suggest an electrode arrangement altering an electrical potential of the curtain as it moves from the curtain applicator unit to the moving substrate, as recited in claim 66.

An advantage of Applicants' invention is that the electrical potential of the curtain is altered after it leaves the current applicator unit, thereby not requiring the applicator unit itself to be at an elevated potential. For the foregoing reasons, Applicants submit that claim 66 and claims 67 and 69 depending therefrom, are now in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claims 66, 67 and 69 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,837,324 (Yapel et al.), Applicants have amended claim 66 and submit that claim 66, 67 and 69 are now in condition for allowance.

Yapel et al. disclose a profiled edge guide (Fig. 1) of a slide coating apparatus 2. Slide coating apparatus 2 includes a coater face 4 having one or more feed slots 6 of slot width W. Coating apparatus 2 further includes edge guides 12 located along the length of coating apparatus 2. Coating fluid 8 flows from feed slot 6 and flows on film face 4 (column 3, lines 28-34).

In contrast, claim 66 as amended, recites in part:

an electrode arrangement altering an electrical potential of said curtain as it moves from said curtain applicator unit to the moving substrate.

(Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Yapel et al. or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Yapel et al. disclose a profiled edge guide of a slide coating apparatus. In contrast thereto, Applicants' invention alters the electrical potential of the curtain as it is in route to the moving substrate. Therefore, Yapel et al. fails to disclose, teach or suggest an electrode arrangement

altering an electrical potential of the curtain as it moves from the curtain applicator unit to the moving substrate, as recited in claim 66.

An advantage of Applicants' invention is that the electrical potential of the curtain is altered after it leaves the current applicator unit, thereby not requiring the applicator unit itself to be at an elevated potential. For the foregoing reasons, Applicants submit that claim 66 and claims 67 and 69 depending therefrom, are now in condition for allowance, which is hereby respectfully requested.

Claim 72 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Conroy et al. in view of WO 89/05477 (Hartman). However, claim 72 depends from claim 66, which is in condition for allowance for the reasons given above. Accordingly, Applicants submit that claim 72 is now in condition for allowance, which is hereby respectfully requested.

Claim 72 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Yapel et al. in view of Hartman. However, claim 72 depends from claim 66, which is in condition for allowance for the reasons given above. Accordingly, Applicants submit that claim 72 is now in condition for allowance, which is hereby respectfully requested.

Applicants thank the Examiner for the indication that claims 57-65, 68, 70, 71 and 73 would be found allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants have amended claims 57, 70, 71 and 73 placing them in independent form thereby placing claims 57-65, 68, 70, 71 and 73 in condition for allowance, which is hereby respectfully requested.

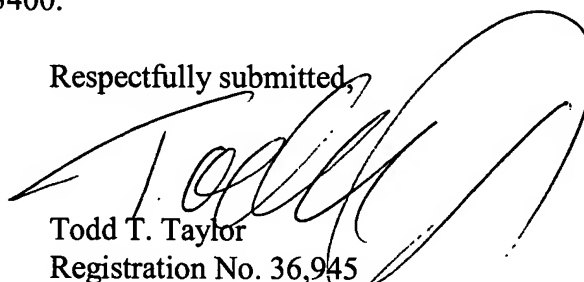
For the foregoing reasons, Applicants submit that the pending claims are definite and do particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Moreover, Applicants submit that no combination of the cited references teaches,

discloses or suggests the subject matter of the amended claims. The pending claims are therefore in condition for allowance, and Applicants respectfully request withdrawal of all rejections and allowance of the claims.

In the event Applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefor and authorize that any charges be made to Deposit Account No. 20-0095, TAYLOR & AUST, P.C.

Should any question concerning any of the foregoing arise, the Examiner is invited to telephone the undersigned at (260) 897-3400.

Respectfully submitted,



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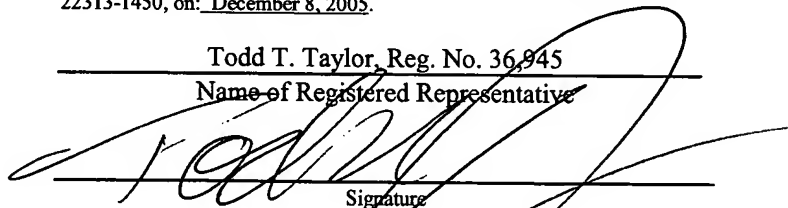
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